Parasitology

EDITORS

F. E. G. COX *and* C. ARME

EDITORIAL ASSISTANT

M. ELISABETH PAINTER Ph.D.

ADVISORY BOARD

L. G. GOODWIN, F.R.S. (Chairman)

R. M. ANDERSON, F.R.S.
R. W. ASHFORD
D. C. BARKER
D. A. P. BUNDY
A. O. BUSH
L. H. CHAPPELL*
D. W. T. CROMPTON
K. DIETZ
H. GINSBURG
D. W. HALTON
C. R. KENNEDY
M. W. KENNEDY
D. L. LEE
D. P. McMANUS
P. W. PAPPAS
R. A. PAX
D. ROLLINSON
A. SAUL
M. E. SCOTT
A. SHER
R. C. TINSLEY
K. VICKERMAN, F.R.S.
D. WAKELIN
P. J. WHITFIELD
R. A. WILSON
M. E. J. WOOLHOUSE

*Representing the British Society for Parasitology.

CAMBRIDGE
UNIVERSITY PRESS

PUBLISHED BY THE PRESS SYNDICATE OF THE UNIVERSITY OF CAMBRIDGE
The Pitt Building, Trumpington Street, Cambridge CB2 1RP, United Kingdom

CAMBRIDGE UNIVERSITY PRESS
The Edinburgh Building, Cambridge CB2 2RU, United Kingdom
40 West 20th Street, New York, NY 10011–4211, USA
10 Stamford Road, Oakleigh, Melbourne 3166, Australia

© Cambridge University Press, 1998

Printed in Great Britain by the
University Press, Cambridge

CONTENTS

PART 1 JANUARY 1998

SENOK, A. C., LI, K., NELSON, E. A. S., ARUMANAYAGAM, M. AND LI, C. K. Flow cytometric assessment of oxidant stress in age-fractionated thalassaemic trait erythrocytes and its relationship to *in vitro* growth of *Plasmodium falciparum* 1

MONIS, P. T., ANDREWS, R. H., MAYRHOFER, G., MACKRILL, J., KULDA, J., ISAAC-RENTON, J. L. AND EY, P. L. Novel lineages of *Giardia intestinalis* identified by genetic analysis of organisms isolated from dogs in Australia 7

SOMMER, C. Quantitative characterization, classification and reconstruction of oocyst shapes of *Eimeria* species from cattle 21

ZHANG, L.-H., CHAI, J.-J., JIAO, W., OSMAN, Y. AND MCMANUS, D. P. Mitochondrial genomic markers confirm the presence of the camel strain (G6 genotype) of *Echinococcus granulosus* in north-western China 29

SPEER, C. A. AND DUBEY, J. P. Ultrastructure of early stages of infections in mice fed *Toxoplasma gondii* oocysts 35

DUBEY, J. P. Re-examination of resistance of *Toxoplasma gondii* tachyzoites and bradyzoites to pepsin and trypsin digestion 43

RIBEIRO, F., COELHO, P. M. Z., VIEIRA, L. Q., POWELL, K. AND KUSEL, J. R. Membrane internalization processes in different stages of *Schistosoma mansoni* as shown by a styryl dye (Frei Mao 1–43) 51

WU, Z., NAGANO, I. AND TAKAHASHI, Y. Differences and similarities between *Trichinella spiralis* and *T. pseudospiralis* in morphology of stichocyte granules, peptide maps of excretory and secretory (E–S) products and messenger RNA of stichosomal glycoproteins 61

WALLACE, D. S., BAIRDEN, K., DUNCAN, J. L., ECKERSALL, P. D., FISHWICK, G., GILL, M., HOLMES, P. H., MCKELLAR, Q. A., MURRAY, M., PARKINS, J. J. AND STEAR, M. J. The influence of dietary supplementation with urea on resilience and resistance to infection with *Haemonchus contortus* 67

MARCOGLIESE, D. J. AND CONE, D. K. Comparison of richness and diversity of macroparasite communities among eels from Nova Scotia, the United Kingdom and Australia 73

BOOTH, M., BUNDY, D. A. A. P., ALBONICO, M., CHWAYA, H. M., ALAWI, K. S. AND SAVIOLI, L. Associations among multiple geohelminth species infections in school children from Pemba Island 85

PART 2 FEBRUARY 1998

HUBER, W., HAJI, H., CHARLWOOD, J. D., CERTA, U., WALLIKER, D. AND TANNER, M. Genetic characterization of the malaria parasite *Plasmodium falciparum* in the transmission from the host to the vector 95

BALANCO, J. M. F., PRAL, E. M. F., DA SILVA, S., BIJOVSKY, A. T., MORTARA, R. A. AND ALFIERI, S. C. Axenic cultivation and partial characterization of *Leishmania braziliensis* amastigote-like stages 103

APPLETON, P. L. AND VICKERMAN, K. *In vitro* cultivation and developmental cycle in culture of a parasitic dinoflagellate (*Hematodinium* sp.) associated with mortality of the Norway lobster (*Nephrops norvegicus*) in British waters 115

SCHÜßLER, P., KÖHRER, K., FINKEN-EIGEN, M., MICHEL, A., GREVELDING, C. G. AND KUNZ, W. A female-specific cDNA sequence of *Schistosoma mansoni* encoding an amidase that is expressed in the gastrodermis 131

HORÁK, P., KOVÁŘ, L., KOLÁŘOVÁ, L. AND NEBESÁŘOVÁ, J. Cercaria–schistosomulum surface transformation of *Trichobilharzia szidati* and its putative immunological impact 139

WOOLHOUSE, M. E. J. AND HARGROVE, J. W. On the interpretation of age-prevalence curves for trypanosome infections of tsetse flies 149

SHU, H. H. AND GÖRINGER, H. U. *Trypanosoma brucei* mitochondrial ribonucleoprotein complexes which contain 12S and 9S ribosomal RNAs 157

MURTA, S. M. F. AND ROMANHA, A. J. *In vivo* selection of a population of *Trypanosoma cruzi* and clones resistant to benznidazole 165

WAMAE, C. N., GATIKA, S. M., ROBERTS, J. M. AND LAMMIE, P. J. *Wuchereria bancrofti* in Kwale District, Coastal Kenya: patterns of focal distribution of infection, clinical manifestations and anti-filarial IgG responsiveness 173

HOLZ, R. A., WRIGHT, D. J. AND PERRY, R. N. Changes in the lipid content and fatty acid composition of 2nd-stage juveniles of *Globodera rostochiensis* after rehydration, exposure to the hatching stimulus and hatch 183

CARVER, F. J. AND HURD, H. The effect of metacestodes of *Hymenolepis diminuta* on the bean-shaped accessory glands in male *Tenebrio molitor* 191

TOPP, H., DUDEN, R., STEPHAN, U. AND SCHÖCH, G. The degradation rates of cytoplasmic tRNA, rRNA and mRNA in rats are elevated after infection with *Nippostrongylus brasiliensis* 197

PART 3 MARCH 1998

SHAIO, M.-F., WANG, P., LEE, C.-S., SIMS, P. F. G. AND HYDE, J. E. Development and comparison of quantitative assays for the dihydropteroate synthetase codon 540 mutation associated with sulfadoxine resistance in *Plasmodium falciparum* 203

GROBUSCH, M. P., ADAGU, I. S., KREMSNER, P. G. AND WARHURST, D. C. *Plasmodium falciparum*: *in vitro* chloroquine susceptibility and allele-specific PCR detection of *Pfmdr1* $^{Asn}86^{Tyr}$ polymorphism in Lambarene, Gabon 211

DUBE, ANURADHA, SHARMA, P., SRIVASTAVA, J. K., MISRA, A., NAIK, S. AND KATIYAR, J. C. Vaccination of langur monkeys (*Presbytis entellus*) against *Leishmania donovani* with autoclaved *L. major* plus BCG 219

SOMERVILLE, R. P. T., ADAMSON, R. E., BROWN, C. G. D. AND HALL, F. R. Metastasis of *Theileria annulata* macroschizont-infected cells in *scid* mice is mediated by matrix metalloproteinases 223

RIBEIRO, F., COELHO, P. M. Z., VIEIRA, L. Q., WATSON, D. G. AND KUSEL, J. R. The effect of praziquantel treatment on glutathione concentration in *Schistosoma mansoni* 229

IMBERT-ESTABLET, D., MONE, H., COULSON, P. S. AND WILSON, R. A. Schistosome-induced portacaval haemodynamic changes in *Rattus rattus* are associated with translocation of adult worms to the lungs 237

SUBRAMANIAN, S., KRISHNAMOORTHY, K., RAMAIAH, K. D., HABBEMA, J. D. F., DAS, P. K. AND PLAISIER, A. P. The relationship between microfilarial load in the human host and uptake and development of *Wuchereria bancrofti* microfilariae by *Culex quinquefasciatus*: a study under natural conditions 243

WILDENBURG, G., KORTEN, S. AND BÜTTNER, D. W. Mast cell distribution in nodules of *Onchocerca volvulus* from untreated patients with generalized onchocerciasis 257

PORTEOUS, I. S. AND PANKHURST, S. J. Social structure of the mara (*Dolichotis patagonum*) as a determinant of gastro-intestinal parasitism 269

FELLOWES, R. A., MAULE, A. G., MARKS, N. J., GEARY, T. G., THOMPSON, D. P., SHAW, C. AND HALTON, D. W. Modulation of the motility of the vagina vera of *Ascaris suum in vitro* by FMRFamide-related peptides 277

MORGAN, J. A. T. AND BLAIR, D. Relative merits of nuclear ribosomal internal transcribed spacers and mitochondrial CO1 and ND1 genes for distinguishing among *Echinostoma* species (Trematoda) 289

PART 4 APRIL 1998

OWEN, M. R. AND TREES, A. J. Vertical transmission of *Toxoplasma gondii* from chronically infected house (*Mus musculus*) and field (*Apodemus sylvaticus*) mice determined by polymerase chain reaction 299

ZAKAI, H. A., CHANCE, M. L. AND BATES, P. A. *In vitro* stimulation of metacyclogenesis in *Leishmania braziliensis*, *L. donovani*, *L. major* and *L. mexicana* 305

VAN HERWERDEN, L., BLAIR, D. AND AGATSUMA, T. Intra- and interspecific variation in nuclear ribosomal internal transcribed spacer 1 of the *Schistosoma japonicum* species complex 311

DAY, T. A. AND CHEN, G.-Z. The metalloprotease inhibitor 1, 10-phenanthroline affects *Schistosoma mansoni* motor activity, egg laying and viability 319

WAHL, G., EKALE, D. AND SCHMITZ, A. *Onchocerca ochengi*: assessment of the *Simulium* vectors in North Cameroon 327

WAHL, G. AND SCHIBEL, J. M. *Onchocerca ochengi*: morphological identification of the L3 in wild *Simulium damnosum* s.l., verified by DNA probes 337

WAHL, G., ENYONG, P., NGOSSO, A., SCHIBEL, J. M., MOYOU, R., TUBBESING, H., EKALE, D. AND RENZ, A. *Onchocerca ochengi*: epidemiological evidence of cross-protection against *Onchocerca volvulus* in man 349

INGOLD, K., GOTTSTEIN, B. AND HEMPHILL, A. Identification of a laminated layer-associated protein in *Echinococcus multilocularis* metacestodes 363

KORNEVA, J. V., KUPERMAN, B. I. AND DAVYDOV, V. G. Ultrastructural investigation of the secondary excretory system in different stages of the procercoid of *Triaenophorus nodulosus* (Cestoda, Pseudophyllidea, Triaenophoridae) 373

LIDDELL, S. AND KNOX, D. P. Extracellular and cytoplasmic Cu/Zn superoxide dismutases from *Haemonchus contortus* 383

WALTHER, B. A. AND MORAND, S. Comparative performance of species richness estimation methods 395

PART 5 MAY 1998

HOSHEN, M. B., STEIN, W. D. AND GINSBURG, H. Modelling the chloroquine chemotherapy of falciparum malaria: the value of spacing a split dose 407

DRAKELEY, C. J., MULDER, L., TCHUINKAM, T., GUPTA, S., SAUERWEIN, R. AND TARGETT, G. A. T. Transmission-blocking effects of sera from malaria-exposed individuals on *Plasmodium falciparum* isolates from gametocyte carriers 417

MIKHEEV, V. N., VALTONEN, E. T. AND RINTAMÄKI-KINNUNEN, P. Host searching in *Argulus foliaceus* L. (Crustacea: Branchiura): the role of vision and selectivity 425

THOMAS, F. AND POULIN, R. Manipulation of a mollusc by a trophically transmitted parasite: convergent evolution or phylogenetic inheritance? 431

DEZFULI, B. S., ONESTINI, S., CARCUPINO, M. AND MISCHIATI, C. The cement apparatus of larval and adult *Pomphorhynchus laevis* (Acathocephala: Palaeacanthocephala) 437

BOULAY, M., SCOTT, M. E., CONLY, S. L., STEVENSON, M. M. AND KOSKI, K. G. Dietary protein and zinc restrictions independently modify a *Heligmosomoides polygyrus* (Nematoda) infection in mice 449

MATSUMOTO, J., YAGI, K., NONAKA, N., OKU, Y. AND KAMIYA, M. Time-course of antibody response in mice against oral infection with eggs of *Echinococcus multilocularis* 463

DAVIS, R. E. Neurophysiology of glutamatergic signalling and anthelmintic action of *Ascaris suum*: pharmacological evidence for a kainate receptor 471

DAVIS, R. E. Action of excitatory amino acids on hypodermis and the motornervous system of *Ascaris suum*: pharmacological evidence for a glutamate transporter 487

PART 6 JUNE 1998

ROPER, C., RICHARDSON, W., ELHASSAN, I. M., GIHA, H., HVIID, L., SATTI, G. M. H., THEANDER, T. G. AND ARNOT, D. E. Seasonal changes in the *Plasmodium falciparum* population in individuals and their relationship to clinical malaria: a longitudinal study in a Sudanese village 501

LIN, C. T., HOU, R. F. AND CHEN, C. C. Formation of basement membrane-like structure terminates the cellular encapsulation of microfilariae in the haemocoel of *Anopheles quadrimaculatus* 511

JOHANSEN, M. V. Effect of praziquantel treatment on experimental porcine *Schistosoma japonicum* infection 519

LOGULLO, C., DA SILVA VAZ, I., SORGINE, M. H. F., PIAVA-SILVA, G. O., FARIA, F. S., ZINGALI, R. B., DE LIMA, M. F. R., ABREU, L., FIALHO OLIVEIRA, E., ALVES, E. W., MASUDA, H., GONZALES, J. C., MASUDA, A. AND OLIVEIRA, P. L. Isolation of an aspartic proteinase precursor from the egg of a hard tick, *Boophilus microplus* 525

HAJNICKA, V., FUCHSBERGER, N., SLOVÁK, M., KOCAKOVA, P., LABUDA, M. AND NUTTAL, P. A. Tick salivary gland extracts promote virus growth *in vitro* 533

OCHANDA, H., YOUNG, A. S., MEDLEY, G. F. AND PERRY, B. D. Vector competence of 7 rhipicephalid tick stocks in transmitting 2 *Theileria parva* parasite stocks from Kenya and Zimbabwe 539

MORLAIS, I., GREBAUT, P., BODO, J. M., DJOHA, S. AND CUNY, G. Characterization of trypanosome infections by polymerase chain reaction (PCR) amplification in wild tsetse flies in Cameroon 547

COLHOUN, L. M., FAIRWEATHER, I. AND BRENNAN, G. P. Observations on the mechanism of eggshell formation in the liver fluke, *Fasciola hepatica* 555

SCOTT, I., STEAR, M. J., IRVINE, J., DICK, A., WALLACE, D. S. AND MCKELLAR, Q. A. Changes in the zymogenic cell populations of the abomasa of sheep infected with *Haemonchus contortus* 569

COX, D. M. AND HOLLAND, C. V. The relationship between numbers of larvae recovered from the brain of *Toxocara canis*-infected mice and social behaviour and anxiety in the host 579